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The Performance of Broiler Chickens with The Addition of Dayak Onion Extract in Drinking Water

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ABSTRACT

This research was conducted to study the ability of Dayak onion extract added to drinking water on the performance of body weight gain, feed consumption, and water consumption of broiler chickens. The experiment used 80 DOC broiler aged 4 days from strain Abror Acres CP 707, using complete randomized design (RAL) with 5 treatments and 4 replicated of 0 gr, 5 gr, 10 gr, 15 gr and 20 gr Dayak onion extract per day. Feed and drinking water were given on ad libitum. Data were analyzed by using the Analysis of Variance (ANOVA) and significant effect was tested with Duncan's New Multiple Rang Test. The results of this study showed that giving Dayak onion extract with level of 0 gr, 5 gr, 10 gr, 15 gr and 20 gr in broiler chickens provided no significant difference ($p>0,5$) on body weight gain, feed consumption, and water consumption. The conclusion of this research is giving the level of Dayak onion extract on the drinking water does not significantly ($P>0,05$) affect the body weight gain, feed consumption, and water consumption of broiler chicken.

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1. Introduction

Meeting the food needs of people in West Kalimantan cannot be separated from the provision of protein, both animal and vegetable protein. Meat production in West Kalimantan in 2017 was 71,570 tons and increased by 12.5% to 80,529 tons in 2018 [1]. However, animal food consumption is still 11.6% lower than the recommended dietary pattern of the Indonesian government, which is 12% [2]. Based on the data [3], Indonesian consumption of chicken meat/year is only 7.1 kg/capita, still below neighboring Malaysia which has reached 46.9 kg/capita, and the United States has reached 49.6 kg/capita. In line with the increasing population in Indonesia and increasing public awareness of quality nutrition, the need for animal protein from livestock is increasing from year to year. The growing growth of culinary businesses made from chicken meat from street vendors to shopping centers has resulted in the business of broiler chickens growing. Broiler chickens harvest only takes 1-1.5 months. Broiler chickens need to be fed according to their production phase to grow optimally. In the first week of consuming 0.14 grams of feed/head, the second week of 0.25 grams/head, the third week of 0.34 grams/head, the fourth week of 0.45 grams/head, and the fifth week of 0.53 gram/head. [4] said that the chicken for 5 weeks will consume approximately 1.67 kg/head of feed. Broiler chickens should be given feed and drink *ad libitum*,

and the need for standard broiler feed for 5 weeks is approximately 1.55 kg/head. The quality of drinking water is very important for the growth of broiler chickens. Water functions as regulating livestock body temperature, lifting nutrients, body fluids, removing metabolic waste through the cloaca, namely in the form of urine and feces. The quality of drinking water for broiler chickens is good at a pH level of 6.8-7.5 because the pH level is below 6.3 affects performance [5].

An improvement of production management needs to be done to further increase the productivity of broiler chickens, by using antioxidants and increasing appetite. The use of synthetic antioxidants has been abandoned by European and American countries because they are carcinogenic when given in high amounts [6]. Indonesia is a country that has a lot of bio diversities but has not been well utilized. One of the alternatives to antibiotics is Dayak onions, which are endemic to the island of Kalimantan. Dayak onions contain phytochemical compounds in the form of alkaloids, tannins, phenolics, flavonoids, and triterpenoids which have antioxidant activity. Dayak onions are antibiotic compounds that can be used as growth promoters and are also able to increase the efficiency of feed use and improve the reproduction of broiler chickens. This onion has high active compounds especially phenolics and flavonoids. The active compounds in Dayak onions are *Allicin*, *Selenium* and *Methylate Sulfide*. *Allicin* compounds are antibacterial and can kill pathogenic bacteria. Allicin exhibits antimicrobial activity by inhibiting RNA synthesis rapidly and completely. Moreover, DNA and protein synthesis are partially inhibited. *Selenium* works as an anti-oxidant and *Methylate Trisulfisa* prevent blood clots. In addition to these active compounds, garlic also contains the enzyme germanium, a substance that can prevent red blood cells from being damaged. All of these compounds will be expected to increase added value for better metabolism, better absorption of food substances, maximum weight gain of broiler chickens and not too much feed is consumed. Research using garlic powder with a concentration of 5% can inhibit the growth of bacteria which is equivalent to tetracycline 100 µg / ml [7]. Research [8] with the treatment of water extract and ethanol garlic can inhibit the growth performance of *Staphylococcus Aureus*, *Streptococcus Agalactia*, and *Escherichia Coli*. This study aims to determine the effect of drinking water from broiler chickens plus Dayak onion extract on daily body weight, water consumption, and feed consumption.

2. Method

A total of 80 mixed-sex DOC in the market are often referred to as CP 707 with Abror Acres strain, as research material and purchased in Pontianak City. DOC in this study was maintained for 35 days. The provision of feed using commercial feed BP 11 produced by the company PT Chareon Pokphand, with nutritional values as shown in table 1. Feeding and drinking for broilers in the study was given *ad libitum*, in each cage that was equipped with a feed and water reservoir. drink. Cleaning the drinking water and feed containers were cleaned everyday. The use of antiseptic and fumigation was sometimes periodic. The vaccination program as carried out regularly using the Gumboro vaccine, and Lasota's ND were dripped completely into the eyes of broiler chickens.

Dayak onion extract (DOE) (*Eleutherine Palmifolia*) was made by maceration using a water solvent. Fresh Dayak onions purchased in Pontianak City are mashed using a blender by dissolving in 1 to 4 water. Then the mixture is soaked for 30 minutes in a sonicator GFL 1092 [9]. Next, shaking the solution for 2 hours using an incubator shaker at room temperature.

This study used a complete randomized design (CRD) with 5 treatments and 4 replications. The experimental treatment levels are as follows:

- P0: BP 11 + Drinking water (0 g DOE / 0.5 L water) (control)
- P1: BP 11 + Drinking water (5 g DOE / 0.5 L water)
- P2: BP 11 + Drinking Water (10 gr DOE / 0.5 L Water)
- P3: BP 11 + Drinking Water (15 gr DOE / 0.5 L Water)
- P4: BP 11 + Drinking Water (20 gr DOE / 0.5 L Water)

Feed During the study, broiler chickens used commercial feed BP 11 with nutrient content of

broiler chicken feed as shown in Table 1.

Table 1. Nutrient Content Feed Broiler.

Compositon	Information	Percentage
Moisture	Max	13%
Crude Protein		21-23%
Eter Extract	Min	5%
Crude Fiber	Max	5%
Ash	Max	7%
Calcium	Min	0,90%
Phosporous	Min	0,60%

Source: Chaeron Phokpand Indonesia

The variables observed in the study were: 1. The body weight gain of broiler chickens were calculated using the formula for the final bodyweight of the study reduced by the initial body weight of the study divided by the length of maintenance. 2. Feed consumption was obtained through calculation using the formula for the total feed consumed by each chicken divided by the length of maintenance. 3. Water consumption for broiler chickens was obtained from the formula for the total drinking water consumed by each chicken divided by the length of maintenance [10].

Minitab software was used to analyze the experimental data. If there is a significant difference in an experimental treatment, the Duncan further test is carried out.

3. Results and Discussion

3.1. Body Weight Gain

The addition of Dayak onion extract (*Eleutherine Palmifolia* extract) to drinking water had no significant effect ($P > 0.05$) on body weight gain as shown in Figure 1. The content of food substances was the same in each treatment. The same thing was expected to be the cause of giving Dayak onion water to not affect body weight gain. This output was also supported by the results of the analysis of variance on the final weight which had no significant effect. This study as still below the target body weight of broilers 1.75 kg/head at week 5 which as the standard reference for maintaining modern broilers in Jamaica [11]. This study resulted in the same body weight gain as several studies using garlic flour as feed additive with weight gain range of 1.3-1.5 kg/head which was maintained for 35 days [12]. In addition, the provision of Dayak onion extract water (*Eleutherine Palmifolia*) which had a positive effect on mortality was thought to be a supporting factor in reducing the effect of *stress* on broiler chickens with the addition of leek water (*Eleutherine Palmifolia*). This is indicated by the more agile behavior of chickens compared to P0 (control). In non-control treatments such as P1, P2, P3, and P4, the mortality rate was lower, 0% than control, which was 13.3%.

In this study, the active compound *Scordinin* in Dayak onions was believed to be less in performance. The active compound *Scordinin* which worked positively to spur the increase in body weight of broiler chickens in the treatment was not effective because of the evaporation process of making Dayak extract. The nature of this compound in Dayak onions was volatile, which as easy to evaporate when there was a heating process.



Figure 1. Final Body Weight on Broiler with the addition of Dayak extract (*Eleutherine Palmifolia*)

3.2. Feed Consumption

Broiler chicken feed consumption are shown in Table 2. The highest value was 113.08 grams / head / day (P1) and the lowest value was 106.22 grams / head / day (P0). The feed consumption in this experiment was higher than the research with the addition of *Citrus Microcarpa* in drinking water which ranged from 76.60-80.68 grams/head/day or 2683.2-2824.5 grams/head for 35 days [13]. The results of the analysis showed that there was no significant difference ($P > 0.05$) in the treatment of adding Dayak onion extract (*Eleutherine Palmifoliaextract*) to the drinking water of broiler chickens during the study. The data from the analysis of feed consumption and water consumption of broiler chickens treated with Dayak onion extract (*Eleutherine Palmifolia*) in drinking water are listed in Table 2.

Feed consumption in this experiment was not significantly different. This was presumably because the antioxidant content in Dayak onion extract (*Eleutherine Palmifoliaextract*) which was useful for increasing appetite and maintaining the health of broiler chickens was not maximally absorbed by intestinal epithelium cells. So that, the metabolism of broilers in this study was not maximum. The results of this study were different from research [14] which states that the use of 2% shallot in drinking water for broiler chickens increases feed consumption, body weight but in the starter period, it does not have a significant effect. Broiler chickens that were given the addition of 1% and 2% shallots in drinking water had a higher daily body weight. This was because the compound content in shallots can reduce the growth of harmful bacteria in the digestive tract of broiler chickens. In contrast to this research, the compound content in Dayak onions has not been effectively absorbed by intestinal epithelium cells, reducing harmful bacteria, and has not been able to improve metabolism. Feed consumption was still higher and body weight gain was lower than the control treatment.

3.3. Water Consumption

The average drinking water needs of broiler chickens with various levels of Dayak onion extract based on the research results were 491.21 mL/head/day (P0) on the highest value. Meanwhile, the lowest value was 463.82 (P1). The result of the Analysis of Variance showed that the addition of Dayak onion extract (*Eleutherine Palmifoliaextract*) to drinking water had no significant effect on water consumption of broiler chickens ($P > 0.05$). Average and results of needs analysis of drinking water for broiler chickens with Dayak onion extract (*Eleutherine Palmifoliaextract*) are listed in table 2.

The result of using turmeric juice in drinking water showed no significantly different in

drinking water consumption with the lowest value of 452.39 birds/day / mL until with the highest value of 494.18 birds/day / mL. This condition indicates that broilers are tolerant of the bitter taste of turmeric essence [15]. This study was treated with 5 gr DOE / 0.5 L drinking water to 20 g DOE / 0.5 L drinking water, the water consumption was relatively the same. This condition indicates that broiler chickens are tolerant of the bitter taste of Dayak onion extract (*Eleutherine Palmifolia* extract). The Dayak onion extract (*Eleutherine Palmifolia*) given did not affect the water consumption of broiler chickens in the treatment. This indicated that the Dayak onion extract (*Eleutherine Palmifolia* extract) given was safe to use.

Table 2. Average feed consumption with the addition of Dayak onion extract (*Eleutherine Palmifolia*) (gr/head / day).

Variables	Treatment				
	P0	P1	P2	P3	P4
Feed Consumption (gr/head/day)	106,22±10,41	113,08±18,53	110,43±19,78	110,27±16,25	112,31±20,29
Water Consumption (mL/ head/day)	491,21±28,21	463,82±36,05	468,82±41,11	464,66±38,29	465,37±40,43

P0: BP11 + Drinking water (0 gr DOE/0,5 L water) (kontrol), P1: BP11 + Drinking water (5 gr DOE/0,5 L water), P2: BP11 + Drinking water (10 gr DOE/0,5 L water), P3: BP11 + Drinking water (15 gr DOE/0,5 L water), P4: BP11 + Drinking water (20 gr DOE/0,5 L water).

Consumption in broilers has certain standards and broiler chickens does not consume water excessively if it is not in a state of stress due to too high a temperature. In addition to excessive drinking water consumption, the ration consumption decreases and have an impact on weight gain of broiler chickens. [16] A research reported that many factors influence drinking water consumption in livestock, including levels of sodium and potassium salts in the ration, enzymes, odor of water, complementary foods, water temperature, disease, type of foodstuff, humidity, wind, composition, feed, age, sex, and type of drinking water container. Another cause that can affect drinking water consumption is the temperature in the cage. The higher the temperature in the cage, the body temperature of the broiler chickens will increase. The increase in body temperature causes the evaporation process to increase with the aim that the heat in the body will be released through evaporation [17].

4. Conclusions

The provision of Dayak onion extract level (*Seleutherine Palmifolia*) with drinking water did not affect body weight gain, feed consumption, and water consumption of broiler chickens.

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